The principles developed were applied to the calculation of surface tension directly from vapor pressure.

Cohesive pressures in adsorbed films are shown to be derivable from vapor pressure and from temperature data.

The essential relation between excess cohesive pressure and osmotic pressure was pointed out.

In a later paper the principles here developed will be applied to some weight-temperature and weight-humidity data.

PALEONTOLOGY.—*A fossil ant from the Lower Eocene (Wilcox) of Tennessee.*[1] F. M. CARPENTER. (Communicated by E. W. BERRY.)

Professor E. W. Berry, of the Johns Hopkins University, recently sent me for identification a large ant wing from the Wilcox clays of Tennessee.[2] Since venation is of little value in the taxonomy of the Formicidae, it is quite impossible to determine the exact affinities of this new species. The presence of a discoidal and two cubital cells eliminates it from the Formicidae, to which one might at first be tempted to assign such a large species, and there are, moreover, several structural characteristics so strongly suggestive of the Ponerines that I do not hesitate to place it within this subfamily. The generic affinities, of course, are more obscure. The position of the transverse vein (Tr) at the base of the discoidal cell is similar to that in some genera of Ponerines, mostly within the tribe Ponerini. The first and second cubital cells are much smaller than in any other known ant wing, and the apical side of the first cubital cell is unusually remote from the corresponding side of the second cubital, of which it is generally a continuation. The nearest approach to these conditions is found in the Neotropical *Dinoponera*, and I am inclined to believe that this wing belonged to a species more or less closely related to *Dinoponera*.[3] Such a relationship seems even more probable when we consider that a similar Ponerine genus, closely allied to *Dinoponera* and the South African *Streblognathus*, existed in the Miocene of Florissant, Colorado.[4]

[1] Received May 31, 1929.

[2] Only a few insects, Coleoptra, Trichoptera, and Isoptera, have been described from this formation.

[3] Professor W. M. Wheeler has kindly permitted me to compare this fossil with the ants in his collection, and he also assisted me in making these comparisons.

[4] This Florissant genus is described in my monograph of the fossil ants of North America, now in press (Bulletin Mus. Comp. Zool.).

Eoponera, new genus

Very large ants allied to *Dinoponera*. Fore wing with a small first cubital cell, the apical side joined to the basal part of the stigma; second cubital cell also very short; transverse vein leading to the anal from the base of the discoidal cell.

Genotype: *Eoponera berryi*, new species.

Eoponera berryi, new species

Fig. 1

Represented by the obverse and reverse of a fore wing, 26 mm. long, and 7 mm. wide. The stigma is long and narrow; the discoidal cell is triangular. The apex of the wing is missing, but from the rest of the fossil one would assume that the shape of the complete wing would be much like that of *Myrmecia*.

Holotype: Cat. no. 80825, U. S. N. M. Collected at Puryear, Henry County, Tennessee.

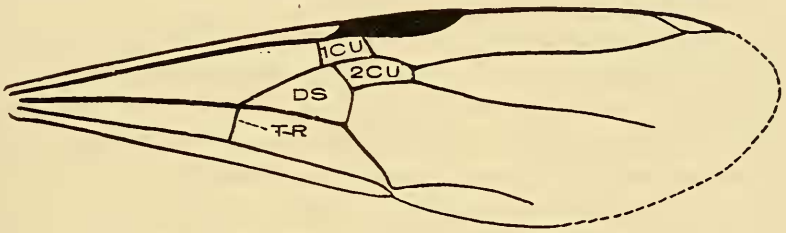

Fig. 1.—Forewing of *Eoponera berryi*, n. sp., from the lower Eocene clays of Tennessee. *1 Cu* and *2 Cu*, first and second cubital cells; *Ds*, discoidal cell; *Tr*, transverse vein.

Although the generic affinities of this species are obscure, it is one of the most interesting fossil ants that has been found. Its great size shows that the complete insect must have had an expanse of at least two and a quarter inches, or 57 mm.! The only known recent ant of such dimensions is *Camponotus* (*Dinomyrmex*) *gigas* (Latr.), of Sumatra and the Malay Peninsula. *Dinoponera grandis* (Guérin) is the largest Ponerine, and although no winged female of this ant seems to exist at present, it is very probable that its queen would be about the same size as that of *E. berryi*. A still more interesting aspect of this new ant is its geological position. Until now the oldest record of the ants has been in the Green River Shale of Utah, Wyoming and Colorado, which is of Middle Eocene age (Auversian). Professor Berry's comprehensive study on the flora of the Wilcox formation has shown that these beds are of Lower Eocene age (Sparnacian-Ypresian), so that this new fossil is the earliest ant that has been found. Strangely enough, the Green River ant-fauna, although not well known seems to be about as highly developed as that existing to-day, and we can only hope that further specimens from the Wilcox beds will be complete enough to throw some light on the origin of the Formicidae.